



Connecticut Clean Air Construction Initiative

March 31, 2006

The Construction Areas

- A portion of I-95 going through a Major Connecticut urban area with road widening and a bridge replacement
 - Affected towns - Branford, East Haven and New Haven
 - Project duration estimated to be 21 years
 - In Urban area which is in non-attainment for Ozone, PM10 and PM2.5
 - 7.2 mile of construction work

- New specifications require that retrofitted equipment must provide pollution reductions of at least 20% PM, 40% CO, and 50% Hydrocarbons and be on EPA Approved Technology List
- During construction, Contract D had a total of 30 pieces of non-road equipment retrofitted
- As of March 2006, 70 pieces of non-road equipment have been retrofitted in Contract C1 and C2.
- Contract E1 has 10 pieces of non-road equipment retrofitted and a Mitigation Plan in place to protect a Church and Day Care.

- Construction companies involved in the Program have voluntarily switched from using #2 diesel fuel to #1 diesel fuel in their non-road equipment.
- Change of diesel fuel type has resulted in a reduction of sulfur that is exhausting from non-road diesel equipment.
 - Diesel # 2 has 3,000 ppm of Sulfur
 - Diesel #1 has 500 ppm of Sulfur. (On-Road Diesel)

Tale of Two Contractors

- Contractor D - Out of State Contractors
- How they complied:
 - Outfitted Construction Equipment
 - Installed an oxidation catalyst on equipment, then rotated onto another similar piece of equipment
 - Purchased and installed OC on rental and subcontractors
 - One metal fatigue failure on a Caterpillar Dozer
 - Storing emission equipment for future use
 - Emission reduction equipment not require in their State

Retrofitted Construction Equipment at Contract D Job Site



CAT M318 Backhoe
Retrofitted with a
Oxidation Catalyst



Tale of Two Contractors

- Contractor C1, C2 and E1- Major Connecticut Contractors
- How they complied:
 - Outfitted Construction Equipment
 - Installed OC on equipment by rotating construction equipment off site and back on to site with retrofits
 - Subcontractors have install their own emission catalyst and one sub-contractor is using fuel additive with Oxidation Catalysts
 - Plans to keep all retrofits on after the end of Contract
 - Had 9 pieces on Construction Equipment before starting of contract work and on site.

***Retrofitted with
Oxidation Catalyst
Contract C1***





**Retrofitted with
Oxidation Catalyst
Contract C1**

Partnership

- The most efficient way to accomplish any task is by working together
 - Connecticut: DOT - DEP - DMV
 - Private: CCIA - Representing 600 Construction Companies
 - Regional New England: NESCAUM
 - PB - Consultant of New Haven Harbor Project and Big Dig (Learned from Massachusetts project)

Still working together to achieve the goal

The Specifications

- Notice to Contractors
 - Placed in the Bid Package as a requirement
 - The wording was designed with flexible language to reflect future changes in technology

NTC – Diesel Vehicle Emissions Controls

All diesel powered construction equipment with engine horsepower (HP) ratings of 60 HP and above, on the project for a period in excess of 30 days shall be retrofitted with Emission Control Devices and/or use Clean Fuels in order to reduce diesel emissions.

<http://www.epa.gov/oms/retrofit/retroverifiedlist.htm>

<http://www.arb.ca.gov/diesel/mobile.htm>

Additional General Compliance

All motor vehicles and/or construction equipment must comply with all pertinent State and Federal regulations relative to exhaust emission controls and safety.

Connecticut General Statutes - Sec. 14-164i

Connecticut's Heavy Duty Diesel Emissions Program

Existing State Regulation

- Department of Motor Vehicles
 - Diesel Opacity Testing Program
 - Commercial Motor Vehicles over 26,000 lbs. gross weight
 - Commercial Motor Vehicles designed to transport a total of 16 passengers
 - Commercial Motor Vehicles transporting hazardous material requiring Placard

Lt David Maestrini and DMV Inspector setting up opacity test



Random check – Fail the Inspection



- Connecticut DMV has been working with the construction companies to inspect every piece of On-road heavy (26,000 gross weight) diesel equipment to ensure it complies with the CT minimum exhaust standards.
- Periodic opacity tests are conducted to maintain this standard.
- Contract D had 3 invited inspections, C1 has had 4 invited inspections with C2 and E1 having 2 each.

Idling

Idling of delivery and/or dump trucks, or other diesel powered equipment shall not be permitted during periods of non-active use, and it should be limited to three minutes in accordance with the Regulations of Connecticut State Agencies Section 22a-174-18(a)(5).

Exceptions to the Idling Limits

- Forced to remain motionless because of traffic conditions or mechanical difficulties
- Necessary to operate heating, cooling or auxiliary equipment when such equipment is necessary to accomplish the intended use
- To bring to the manufacturer's recommended operating temperature
- When the outdoor temperature is below twenty (20) degrees Fahrenheit
- When being repaired.

Monthly Reporting

Update the same information that was included in the initial report, plus include:

- Certified copies of the clean fuel delivery slips for the report time period, noting which vehicles received the clean fuel.
- The addition or deletion of non-road diesel equipment.
- Note any newly retrofitted construction equipment

Initial Reporting

Prior to start of construction, submit a list of the non-road diesel powered construction equipment

Include equipment that:

will be retrofitted with emission control devices
and/or will use Clean Fuels:

- The equipment number, type, make, and contractor/sub-contractor name;
- The emission control device make, model and EPA verification number; and/or
- The type and source of fuel to be used.

Tracking

- Developed a tracking system
 - Bimonthly submittals of equipment on site
 - Duration
 - When retrofitted
 - Problems
 - Work with Contractor - Installation Problems
 - Back Order
 - Advance warning that equipment has been on site 30 days
 - Good working relationship with contractor

P&H 650TC-50 Crane
Retrofitted on
Contract C2 Job Site



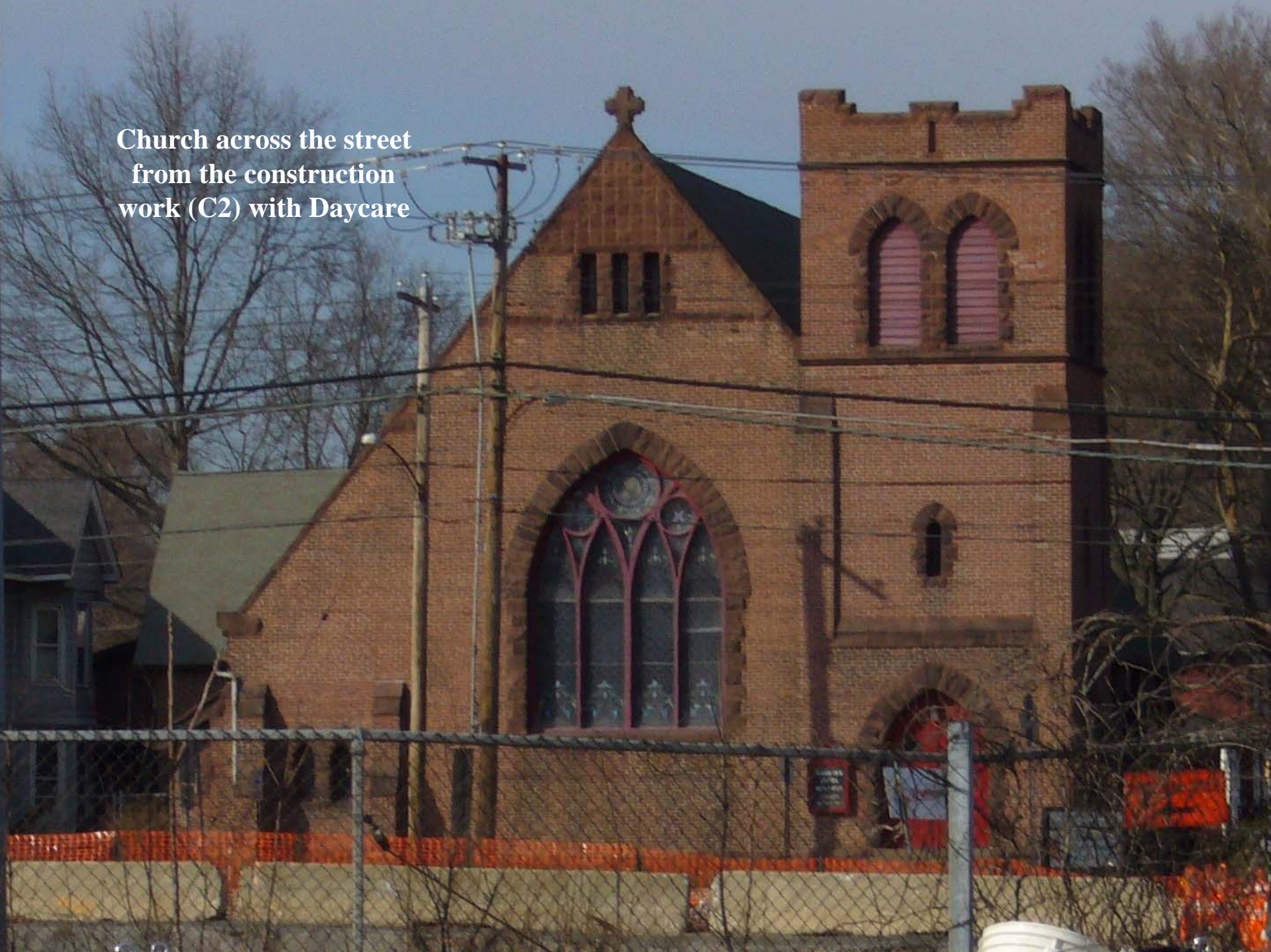
**CAT Dozer Retrofitted
Construction Equipment on
Contract C2**



Sensitive Receptors

- All work shall be conducted to ensure that no harmful effects are caused to adjacent sensitive receptors
- DOT responsible in designating sensitive receptors
- Sensitive receptors are to include but not be limited to hospitals, schools, daycare facilities, elderly housing and convalescent facilities.
- Diesel powered engines shall be located away from fresh air intakes, air conditioners, and windows.

Church across the street
from the construction
work (C2) with Daycare



Activity across the street from the Church



Diesel Emissions Mitigation Plan

- Construction Contractor responsible for mitigation plan
- Required for areas where extensive work will be performed in close proximity (less than 50 feet) to sensitive receptors.
 - No construction will proceed until a sequence of construction and a Diesel Emissions Mitigation plan is submitted
 - approved by the Engineer prior any extensive construction work in close proximity (less than 50 feet) to sensitive receptors.
 - The mitigation plan must address the control of diesel emissions from all diesel powered construction equipment
 - That including the equipment not retrofitted with emission control devices or uses Clean Fuels

**Continual Sweeping
of Tracked dirt
from Construction
equipment**





Dust Control
Measures

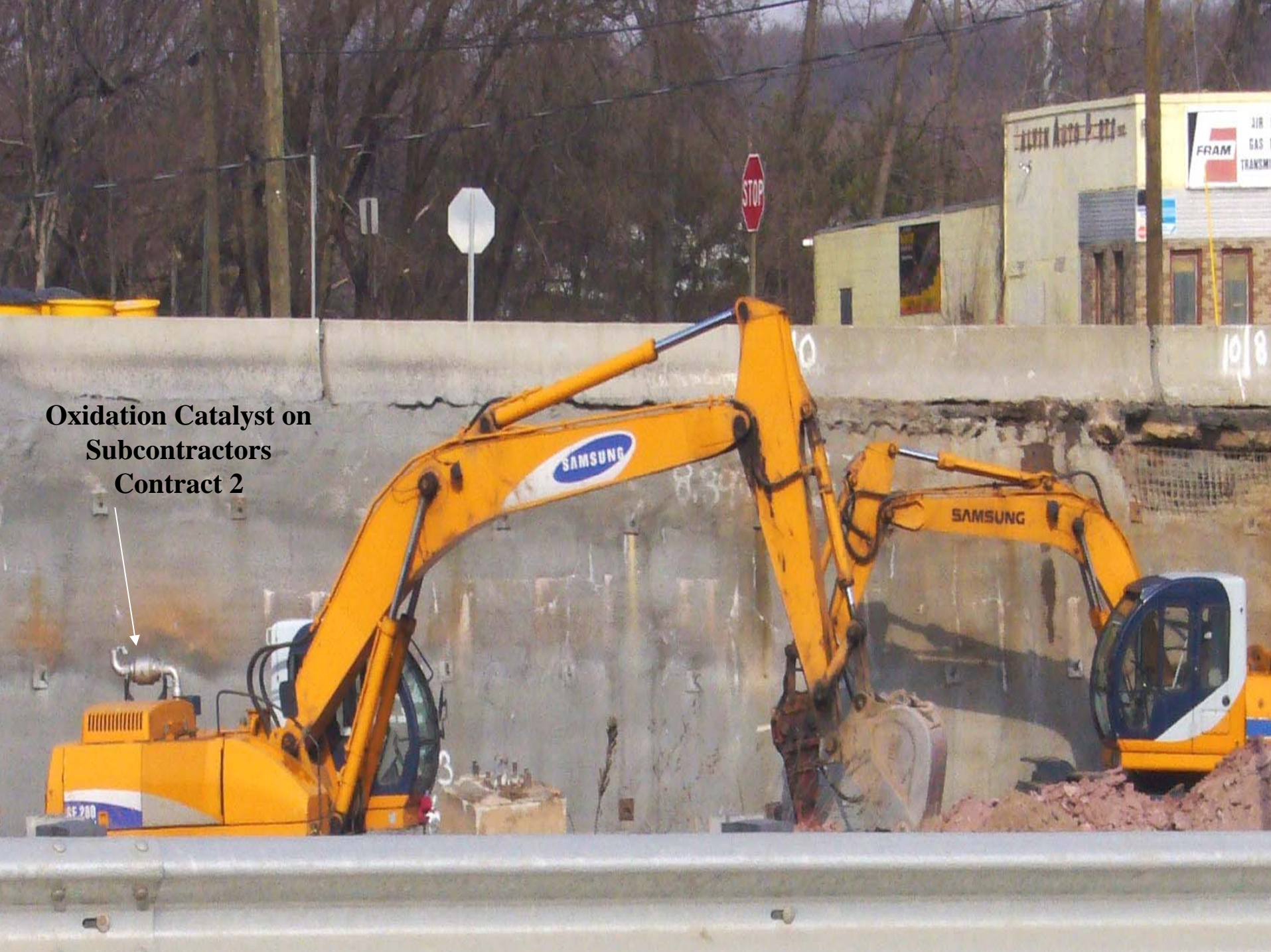
Who pays for retrofit

- As part of the contracts, before bids are submitted, informational meetings make all contractors aware of the requirements of clean fuels and /or retrofitting. The cost of the retrofit equipment and /or clean fuels are included in the general cost of the contract.



**Subcontractor in Contract
C1+C2
Retrofitted with Oxidation
Catalyst and Fuel Additive**

**Oxidation Catalyst on
Subcontractors
Contract 2**



**Subcontractor Oxidation
Catalyst and uses fuel
additive Contract C2**



Non-Compliance

If a non-road diesel-equipped vehicle is found to be in non-compliance with the specification, the contractor will be issued a Notice of Non-Compliance and given a 24 hour period in which to bring the vehicle into compliance or remove it from the project.

Non-Compliance (Cont'd)

If the contractor then does not comply with the specification, all payments will be withheld for the work performed on any item(s) on which the non-conforming equipment was utilized for the time period in which the vehicle was out of compliance.

Equipment on E1



Other State Agencies

Using the Department of Transportation Specifications, the following agencies have tweaked our specification to reflect their specific requirements.

- Department of Public Works
- Department of Economic Development
- Office of Policy Management

Conclusion

- At the start - Invite as many of the major players as possible
 - They will add insight
 - Expect spirited discussion
- All have to be willing to compromise
- Partners work together to Inform and Educate
 - We accomplished the objective by a series of Informational Meetings

Conclusion

- After the start of construction, keep the communication network going
 - The partners will help resolve any problems that might evolve
 - Continue researching any new technologies that might be approved
- Continue to work together to Inform and Educate
- Tracking to see the accomplishment and the glitches
 - Modify procedures to improve the operating system

Contact for more Information

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